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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,318	05/09/2006	Mikhail Nicholas Zervas	SO01-P15	4928

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07/11/2007

EXAMINER
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KING, JOSHUA

ART UNIT	PAPER NUMBER
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2828

MAIL DATE	DELIVERY MODE
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07/11/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/560,318	<b>Applicant(s)</b> ZERVAS ET AL.	
	<b>Examiner</b> Joshua J. King	<b>Art Unit</b> 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 35-68 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 35-68 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/09/2005</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Information Disclosure Statement*

2. The information disclosure statement (IDS) submitted on May 09, 2006 was filed on the mailing date of the instant application on May 09, 2006. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### *Claim Objections*

3. Claim 61 is objected to because of the following informalities: claim 61 is dependent on claim 1. Appropriate correction is required. **For the purpose of this examination**, claim 1 will be interpreted as claim 35.
4. Claim 53 is objected to because of the following informalities: "the waveguide" lacks antecedent basis. Appropriate correction is required.
5. Claims 58-60 are objected to because of the following informalities: applicant has used the term "breadth" inconsistent with its accepted meaning and has not explicitly redefined it in the specification. Appropriate correction is required. **For the purpose of this examination the examiner will understand "breadth" to mean height.**
6. Claim 64 is objected to because of the following informalities: fiber is misspelled. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

7. Claim 61-63 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 35, the applicant has defined the brightness converter by a length; however, in claim 61 the applicant has again defined the brightness converter by a length. It is unclear if these two lengths are the same length or if they are different lengths. It is also unclear which length is being defined if they are different lengths. **For the purpose of this examination, they will be interpreted as the same length.**

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 35-42, 46-54, 64-65, and 68 are rejected under 35 U.S.C. 102(b) as being anticipated by Dejneka et al. (U.S. Patent Number 6,324,326).

10. Dejneka et al. discloses:

- **With respect to claim 35**, a pump source for providing pump radiation (Fig. 2 element 64), and a brightness converter (Fig. 2 element 48), and wherein the brightness converter is defined by a length (Fig. 2 element  $L_T$ ), and contains a substantially rigid region along at least a portion of the length (Fig. 2). See column 3 lines 44-60 for why Fig. 2 acts as a brightness converter.

- **With respect to claim 36**, the brightness converter comprises a core (Fig. 2 element 52), a first cladding (Fig. 2 element 54), and rare earth dopant (column 5 line 67), and is defined by a first end and a second end (Fig. 2 elements 60 and 62).
- **With respect to claim 37**, the brightness converter comprises a tapered region located between the first end and the second end (Fig. 2 element 48), the apparatus further being defined by a cross-sectional area of the first end and a cross-sectional area of the second end, and further wherein the cross-sectional area of the first end is greater than the cross-sectional area of the second end, and the brightness converter is substantially rigid between the first end and the tapered region (Fig. 2 elements 60 and 62).
- **With respect to claim 38**, the pump radiation is coupled from the pump source into the brightness converter using a coupling means (Fig. 4 element 70).
- **With respect to claim 39**, the coupling means is a lens (Fig. 4 element 70).
- **With respect to claim 40**, the apparatus comprises a first reflector for reflecting optical radiation emerging from the first end (Fig. 2 element 60).
- **With respect to claim 41**, including a second reflector (Fig. 2 element 62).
- **With respect to claim 42**, the pump source comprises at least one laser diode, at least one laser diode bar, at least one laser diode stack, or at least one laser diode mini-bar stack (Fig. 4 element 72).
- **With respect to claim 46**, the brightness converter contains a plurality of cores (column 8 lines 4-12).

- **With respect to claim 47**, the brightness converter contains a single core (column 8 lines 4-12).
- **With respect to claim 48**, the brightness converter is circular (Fig. 17c).
- **With respect to claim 49**, the brightness converter is non-circular (Fig. 9 element 300).
- **With respect to claim 50**, the brightness converter comprises a rare-earth dopant (column 5 line 67).
- **With respect to claim 51**, the rare earth dopant is selected from the group comprising Ytterbium, Erbium, Neodymium, Praseodymium, Thulium, Samarium, Holmium, Dysprosium, Erbium codoped with Ytterbium, or Neodymium codoped with Ytterbium (column 5 line 67).
- **With respect to claim 52**, the brightness converter comprises a second cladding (Fig. 13 element 360).
- **With respect to claim 53**, the brightness converter is doped with neodymium or ytterbium (Fig. 2 element 52), and a waveguide is doped with ytterbium, erbium, or erbium co-doped with ytterbium (Fig. 2 element 42).
- **With respect to claim 54**, comprising a waveguide that is pumped by the brightness converter (Fig. 4 element 74).
- **With respect to claim 64**, the brightness converter is formed from an optical fiber preform (column 12 lines 1-18).
- **With respect to claim 65**, the preform is made from silica, silicic, phosphate or phosphatic glass (column 12 line 5).

- **With respect to claim 68**, in the form of a laser, a Q-switched fibre laser, a master oscillator power amplifier, or a laser that contains a frequency converter (Fig. 2).

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dejneka et al. (U.S. Patent Number 6,324,326) in view of Zenteno (U.S. Patent Number 6,370,180).

13. Dejneka et al. does not disclose:

- **With respect to claim 43**, the pump source includes a solid-state laser, a gas laser, an arc lamp, or a flash lamp.
- **With respect to claim 44**, the apparatus comprises a plurality of the pump sources and a combining means for combining pump radiation emitted by the pump sources.
- **With respect to claim 45**, the combining means comprises a beam splitter, a reflector, a polarisation beam combiner, a beam shaper, a wavelength division multiplexer, or a plurality of optical fibres in optical contact along at least a portion of their length.

14. However, Zenteno discloses:

- **With respect to claim 43**, the pump source includes a solid-state laser, a gas laser, an arc lamp, or a flash lamp (Fig. 1 element 22). The advantage is increased optical power (column 1 lines 53-55).
- **With respect to claim 44**, the apparatus comprises a plurality of the pump sources and a combining means for combining pump radiation emitted by the pump sources (Fig. 1 elements 32). The advantage is increased optical power (column 1 lines 53-55).
- **With respect to claim 45**, the combining means comprises a beam splitter, a reflector, a polarisation beam combiner, a beam shaper, a wavelength division multiplexer, or a plurality of optical fibres in optical contact along at least a portion of their length (Fig. 2 element 36).

15. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device disclosed by Dejneka et al. with the pumping arrangement disclosed by Zenteno in order to increase optical power.

16. Claims 55-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dejneka et al. (U.S. Patent Number 6,324,326).

17. Dejneka et al. does not disclose:

- **With respect to claim 55**, the brightness converter is defined by a width, and wherein the width is in the range 0.1 mm to 100 mm.
- **With respect to claim 56**, the width is in the range 0.2 mm to 25 mm.



- **With respect to claim 57**, the width is in the range 5 mm to 15 mm.
- **With respect to claim 58**, the brightness converter is defined by a breadth, and wherein the breadth is in the range 0.1 mm to 100 mm.
- **With respect to claim 59**, the breadth is in the range 0.2 mm to 25 mm.
- **With respect to claim 60**, the breadth is in the range 2 mm to 15 mm.
- **With respect to claim 61**, the brightness converter is defined by a length, and wherein the length is in the range 1 mm to 2000 mm.
- **With respect to claim 62**, the length is in the range 10 mm to 200 mm.
- **With respect to claim 63**, the length is in the range 10 mm to 50 mm.

18. However, the art of lasers well recognizes that the dimensions of a brightness converter are critical in the good performance of lasers (see, for example, the brief summary of the invention in Dejneka et al. column 6-8). The dimensions found in claims 55-63 are therefore result-affecting variables/parameters. And according to established patent law precedent (see, for example M.P.E.P. § 2144.05) therefore it would have been obvious to optimize (for example by routine experimentation) the dimensions of the brightness converter.

19. Claims 52, 66 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dejneka et al. (U.S. Patent Number 6,324,326) in view of Fermann (U.S. Pre-Grant Publication 2002/0172486).

20. Dejneka et al. does not disclose:

- **With respect to claim 66**, the preform defines longitudinally extended holes disposed therein.
- **With respect to claim 67**, the preform includes stress rods.

21. However, Fermann discloses:

- **With respect to claim 52**, a second cladding layer ([0070]). The advantage is to minimize polarization mode-coupling ([0070]).
- **With respect to claim 66**, the preform defines longitudinally extended holes disposed therein (Fig. 4a). The advantage is to obtain an optimum degree of birefringence ([0070])
- **With respect to claim 67**, the preform includes stress rods (Fig. 4a).

22. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device disclosed by Dejneka et al. with holes or stress rods disclosed by Fermann in order to obtain an optimum degree of birefringence.

### ***Conclusion***

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Birks et al. (U.S. Pre-Grant Publication 2004/0175082) see Fig. 2. Prassas et al. (U.S. Pre-Grant Publication 2003/0210725) see Fig. 1. Dejneka et al. (U.S. Pre-Grant Publication 2002/0159736) see Fig. 7. Burke et al. (U.S. Patent Number 6,427,491) see Fig. 6.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua J. King whose telephone number is 571-270-

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1441. The examiner can normally be reached on Mon.-Thurs. 10:00-7:30 and every other Fri. 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Min Sun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JJK 06/26/2007

  
**MIN SUN HARVEY**  
**PRIMARY EXAMINER**